PATENT
Reply under 37 CFR 1.116
EXPEDITED PROCEDURE
Group 1731

AMENDMENT(S) TO THE CLAIMS

1. (Withdrawn) A method for improving the characteristics of a fiber material web produced from a fibrous suspension in a sheet forming device, comprising the steps of:

carrying the fibrous suspension by at least one wire over both a plurality of wire guiding elements and a plurality of dewatering elements;

creating a plurality of cross flows in the fibrous suspension relative to a direction of wire travel; and

achieving both a plurality of improved web properties and a plurality of higher transverse strengths.

2. (Withdrawn) The method of claim 1, wherein the fiber material web is one of a paper web, a cardboard web and a tissue web.

3. (Withdrawn) The method of claim 1, wherein said plurality of cross flows are produced by at least one of said wire guiding elements and said dewatering elements that is at least one of structured transversely to the direction of wire travel and directed transversely to the direction of wire travel.

4. (Withdrawn) A device for improving the characteristics of a fiber material web produced from a fibrous suspension in a sheet forming device, comprising:

at least one wire configured for carrying the fibrous suspension, said at least one wire having a direction of wire travel;

at least one of a plurality of wire guiding elements and a plurality of dewatering elements, said at least one wire traveling one of over and under said at least one of a plurality of wire guiding elements and a plurality of dewatering elements, at least one of said wire guiding element and said dewatering element being at least one of structured transversely and directed transversely to said direction of wire travel; and

a plurality of cross flows produced relative to said direction of wire travel for producing both improved web properties and higher transverse strengths.

5. (Withdrawn) The device of claim 4, wherein the fiber material web is one of a paper web, a cardboard web and a tissue web.

6. (Withdrawn) The device of claim 4, wherein at least one of said plurality of wire guiding elements and said plurality of dewatering elements is structured in the form of at least one indentation.

7. (Withdrawn) The device of claim 4, wherein at least one of said plurality of wire guiding elements and said plurality of dewatering elements is structured in the form of at least one elevation.

8. (Withdrawn) The device of claim 7, wherein said at least one elevation is in the form of at one of a nub structure, a crowned shaped structure, a dome shaped structure and oblong structures.

9. (Withdrawn) The device of claim 4, wherein at least one of said plurality of wire guiding elements and said plurality of dewatering elements are in the form of at least one of a plate and a strip.

10. (Withdrawn) The device of claim 9, wherein said plate is a support plate.

11. (Withdrawn) The device of claim 9, wherein said strip is a support strip.

12. (Withdrawn) The device of claim 4, wherein at least one of said plurality of wire guiding elements and said plurality of dewatering elements are in the form of one of a plurality of inclined short foils and a plurality of short strips.

13. (Withdrawn) The device of claim 12, wherein said plurality of inclined short foils are curved.

14. (Withdrawn) The device of claim 13, wherein said plurality of inclined short strips are straight.

15. (Withdrawn) The device of claim 4, wherein at least one of said plurality of wire

guiding elements and said plurality of dewatering elements are in the form of a rotating element.

16. (Withdrawn) The device of claim 15, wherein said rotating element is one of a grooved roll and a spirally grooved roll.

17. (Withdrawn) The device of claim 15, wherein said rotating element can one of rotate and move at a first speed in a first direction, said at least one wire one of rotates and moves at a second speed in a second direction, said first speed and said second speed are at least one of equal, nonequal, synchronized, forward motion and after-running, said first direction and said second direction are one of a same direction and a different direction.

18. (Withdrawn) The device of claim 15, wherein said rotating element rotates at a crawling speed.

19. (Withdrawn) The device of claim 19, wherein said rotating element includes a cleaning device.

20. (Withdrawn) The device of claim 4, wherein at least one of said plurality of wire guiding elements and said plurality of dewatering elements in said direction of wire travel are at least one of not laterally offset, laterally offset, staggered and alternating.

21. (Withdrawn) The device of claim 4, wherein at least one of said plurality of wire

guiding elements and said plurality of dewatering elements are arranged alternating with at least one of a non-structured plurality of wire guiding elements, a non-directed plurality of wire guiding elements, a non-structured plurality of dewatering elements and a non-directed plurality of dewatering elements.

22. (Withdrawn) The device of claim 4, wherein at least one of said plurality of wire guiding elements and said plurality of dewatering elements are supported flexibly.

23. (Withdrawn) The device of claim 4, wherein at least one of said plurality of wire guiding elements and said plurality of dewatering elements are supported rigidly in a plurality of positions relative to said at least one wire, said plurality of positions are adjustable.

24. (Withdrawn) The device of claim 23, wherein said adjustable plurality of positions are at least one of trough sliding and pivoting.

25. (Withdrawn) The device of claim 4, wherein at least one of said plurality of wire guiding elements and said plurality of dewatering elements are supplied with a vacuum to achieve intensification of said plurality of cross flows relative to said direction of wire travel.

26. (Withdrawn) The device of claim 25, wherein said vacuum is provided by at least one vacuum box.

27. (Withdrawn) The device of claim 25, wherein said at least one vacuum box is at least one of controlled and regulated.

28. (Withdrawn) The device of claim 4, wherein at least one of said plurality of wire guiding elements and said plurality of dewatering elements are at least one of a spreader roll, a spreader type suction unit with a herringbone pattern and a curved spreader bar.

29. (Withdrawn) The device of claim 4, wherein the sheet former is a hybrid-former, at least one of said plurality of wire guiding elements and said plurality of dewatering elements are installed on at least one of a Foudrinier side and a hybrid-former side.

30. (Withdrawn) The device of claim 4, wherein the sheet former is a gap-former, said at least one wire has a first side and a second side opposite said first side, at least one of said plurality of wire guiding elements and said plurality of dewatering elements are installed on at least one of said first side and said second side.

31. (Previously Presented) A method for the production of a fiber material web from a fibrous suspension, comprising the steps of:

dewatering the fibrous suspension in a forming zone;

producing at least one zonal pressure gradient in the fibrous suspension during said dewatering step; and

influencing a main fiber direction in the fiber material web.

32. (Original) The method of claim 31, wherein the fiber material web is one of a paper web, a cardboard web and a tissue web.

33. (Original) The method of claim 31, wherein said forming zone comprises:

at least one wire configured for carrying the fibrous suspension, said at least one wire having a direction of wire travel;

at least one of a plurality of wire guiding elements and a plurality of dewatering elements, said at least one wire traveling one of over and under said at least one of a plurality of wire guiding elements and a plurality of dewatering elements, at least one of said wire guiding element and said dewatering element being at least one of structured transversely and directed transversely to said direction of wire travel; and

a plurality of cross flows produced relative to said direction of wire travel for producing both improved web properties and higher transverse strengths.

34. (Original) The method of claim 31, wherein the fibrous suspension is treated with a vacuum during said dewatering step.

35. (Original) The method of claim 31, wherein at least one of a sectional pressure gradient generation and a vacuum treatment occurs transversely to a machine direction.

36. (Original) The method of claim 35, wherein said method is carried out utilizing a

cross-directionally sectioned vacuum.

37. (Original) The method of claim 31, wherein said method is carried out utilizing at least one of a controlled pressure generation, a regulated pressure generation and a vacuum application.

38. (Previously Presented) The method of claim 31, wherein at least one of at least one dewatering element, at least one forming element and at least one wire guiding element are utilized for a generation of said at least one zonal pressure gradient.

39. (Original) The method of claim 38, wherein the fiber material web that is formed from the fibrous suspension is carried by at least one wire over at least one of said at least one dewatering element, said at least one forming element and said at least one wire guiding element.

40. (Original) The method of claim 38, wherein at least one of said at least one dewatering element, said at least one forming element and said at least one wire guiding element is at least one foil strip positioned diagonally to a direction of web travel.

41. (Original) The method of claim 31, further including at least one dewatering box for at least one of a dewatering, a forming and a wire guidance, at least one dewatering box having at least one diagonally slotted plate cover relative to a direction of web travel, said at least one diagonally slotted plate cover providing a foil effect.

42. (Original) The method of claim 41, wherein said at least one diagonally slotted plate cover includes at least one diagonally progressing bar, said at least one diagonally progressing bar has a discharge side, said at least one diagonally progressing bar is beveled on said discharge side.

43. (Original) The method of claim 41, wherein said dewatering is supplied with a vacuum.

44. (Original) The method of claim 43, wherein said method is carried out using at least one of a controlled dewatering box supplied with a vacuum and a regulated dewatering supplied with a vacuum.

45. (Original) The method of claim 43, wherein said method is carried out using at least one graduated foil in combination with said at least one dewatering box.

46. (Previously Presented) The method of claim 41, wherein said method is carried out in combination with said at least one dewatering box using a dewatering strip which includes a ceramic, and an adjustable strip which includes a polyethylene.

47. (Canceled)

48. (Original) The method of claim 38, wherein at least one of said at least one

dewatering element, said at least one forming element and said at least one wire guiding element include a curved surface over which the fibrous suspension is guided by at least one wire.

49. (Original) The method of claim 48, wherein said curved surface includes a curvature radius greater than 2 m.

50. (Original) The method of claim 48, wherein said curved surface includes a curvature radius greater than 5 m.

51. (Original) The method of claim 48, wherein said curved surface includes a curvature radius greater than 10 m.

52. (Original) The method of claim 48, wherein an angle of wrap is between approximately 10° to approximately 30°.

53. (Original) The method of claim 38, wherein at least one of said at least one dewatering element, said at least one forming element and said at least one wire guiding element include a plurality of sections viewed in cross direction, at least one of said at least one dewatering element, said at least one forming element and said at least one wire guiding element are adjustable in said plurality of sections.

54. (Original) The method of claim 53, further including a plurality of adjustment

parameters associated with said adjustable sections, said plurality of adjustment parameters are sectionally adjusted to influence a respective property profile of the fiber material web.

55. (Original) The method of claim 54, wherein said plurality of adjustment parameters are sectionally adjusted on a basis of at least one off-line measurement.

56. (Original) The method of claim 55, wherein said at least one off-line measurement, is a steady state off-line measurement.

57. (Original) The method of claim 55, wherein said plurality of adjustment parameters are sectionally adjustable by at least one of a manual adjustment and through a control system.

58. (Original) The method of claim 55, wherein said plurality of adjustment parameters are sectionally adjustable through at least one closed control loop.

59. (Original) The method of claim 58, wherein said at least one closed control loop is utilized that encompasses at least one of an in-line acquisition of a product characteristic to be influenced, a characteristic correlating with said product characteristic, at least one control algorithm and at least one relating final control element.

60. (Original) The method of claim 59, wherein said at least one relating final control element is at least one of a dewatering element, a forming element and a wire guiding element.

61. (Original) The method of claim 59, wherein at least one said control algorithm is incorporated into at least one said closed control loop for a mapping.

62. (Original) The method of claim 38, further including at least one angle of attack of at least one of said at least one dewatering element, said at least one forming element and said at least one wire guiding element, said at least one angle of attack being adjustable relative to a direction of web travel.

63. (Original) The method of claim 31, wherein the method is carried out using a dewatering box equipped with at least one of a plurality of vacuum zones and a plurality of vacuum elements, both said plurality of vacuum zones and said plurality of vacuum elements are arranged successively in a direction transverse to web travel, said at least one of a plurality of vacuum zones and a plurality of vacuum elements influencing a longitudinal/cross relationship.

64. (Original) The method of claim 31, wherein the method is carried out using a dewatering box including one of a cover and a plate, both said cover and said plate are diagonally slotted relative to a direction of web travel.

65. (Original) The method of claim 31, wherein the method is carried out using a dewatering box equipped with a plurality of foil strips arranged diagonally to a direction of web travel.

66. (Original) The method of claim 63, further including a plurality of vacuums in said plurality of vacuum zones, each said plurality of vacuums are individually controllable.

67. (Original) The method of claim 41, wherein at least one of said at least one dewatering element, said at least one forming element, said at least one wire guiding element and said at least one dewatering box is equipped with at least one slot having a changeable slot width.

68. (Original) The method of claim 67, further including a vacuum supply that is sectioned in a cross direction.

69. (Original) The method of claim 67, wherein only said slot width is adjustable thereby excluding a cross directionally sectioned vacuum treatment.

70. (Original) The method of claim 63, wherein said plurality of vacuum zones partially overlap.

71. (Original) The method of claim 65, wherein said plurality of foil strips include at least one foil angle, at least one said foil angle is between approximately 0° to 5°.

72. (Original) The method of claim 65, wherein said plurality of foil strips include at least one foil angle, at least one said foil angle is between approximately 0° to 3°.

73. (Original) The method of claim 31, wherein the method is carried out using a dewatering box with one of a perforated cover and a perforated plate.

74. (Original) The method of claim 31, wherein the method is carried out using a forming board, a dewatering box with at least one of a slotted cover, a perforated cover, a slotted plate and a perforated plate, and several foil boxes.

75. (Original) The method of claim 31, wherein the fibrous suspension is treated with a vacuum of between approximately 0 kPa to 50 kPa.

76. (Original) The method of claim 31, wherein the fibrous suspension is treated with a vacuum of between approximately 0 kPa to 25 kPa.

77. (Original) The method of claim 31, wherein said method is carried out in conjunction with at least one of a Foudrinier-Former, a Twin Wire Former, a Gap-Former, a Hybrid-Former, and a graphic Former.

78. (Original) The method of claim 31, wherein said method is carried out in a machine equipped with a plurality of sheet formers for a plurality of multi-ply products.

79. (Original) The method of claim 78, wherein said method is carried out with one of a

control system and a regulator system, each of said control system and said regulator system are effective only upon a ply.

80. (Original) The method of claim 78, wherein said method is carried out with one of a control system and a regulator system, each of said control system and said regulator system are effective upon a plurality of plies.

81. (Original) The method of claim 80, wherein each of said control system and said regulator system are effective upon all plies.

82. (Original) The method of claim 31, wherein said method is carried out in conjunction with a medium stock consistency of the fiber suspension of between approximately 0.1% to 7%

83. (Original) The method of claim 31, wherein said method is carried out in conjunction with a medium stock consistency of the fiber suspension of between approximately 0.5% to 5%.

84. (Original) The method of claim 31, wherein said method is carried out in conjunction with at least one stock containing at least one of at least one recovered paper, at least one liner paper, at least one carton paper and at least one graphic paper.

85. (Original) The method of claim 84, wherein said at least one stock has a medium stock consistency of between approximately 0.3% to 7%.

86. (Original) The method of claim 31, wherein said method is carried out in conjunction with at least one stock containing sack Kraft paper.

87. (Original) The method of claim 86, wherein said method is carried out with a medium stock consistency of between approximately 0.1% to 4%.

88. (Previously Presented) The method of claim 31, wherein said method is carried out to influence at least one of a forming property of the fiber material web and a tear length ratio RL L/Q property of the fiber material web.

89. (Withdrawn) A device for the production of a fiber material web from a fibrous suspension, comprising:

a forming zone;

a plurality of elements in said forming zone; and

at least one zonal pressure gradient produced by said plurality of elements in the fibrous suspension during a dewatering in said forming zone, to appropriately influence a principal fiber orientation.

90. (Withdrawn) The device of claim 89, wherein the fiber material web is one of a

paper web, a cardboard web and a tissue web.

91. (Withdrawn) The device of claim 89, wherein said plurality of elements comprises:

at least one wire configured for carrying the fibrous suspension, said at least one wire having a direction of wire travel;

at least one of a plurality of wire guiding elements and a plurality of dewatering elements, said at least one wire traveling one of over and under said at least one of a plurality of wire guiding elements and a plurality of dewatering elements, at least one of said wire guiding element and said dewatering element being at least one of structured transversely and directed transversely to said direction of wire travel; and

a plurality of cross flows produced relative to said direction of wire travel for producing both improved web properties and higher transverse strengths.

92. (Withdrawn) The device of claim 89, wherein the fibrous suspension is treated with a vacuum during said dewatering in said forming zone.

93. (Withdrawn) The device of claim 89, wherein at least one said plurality of elements and a vacuum application are sectioned when viewed in a cross-machine direction.

94. (Withdrawn) The device of claim 93, further including a cross-directionally sectioned vacuum chamber.

95. (Withdrawn) The device of claim 89, further including at least one of a controlled pressure generation, a regulated pressure generation, a controlled vacuum treatment and a regulated pressure treatment.

96. (Withdrawn) The device of claim 89, further including at least one of at least one dewatering element, at least one forming element and at least one wire guiding element for providing a generation of said at least one zonal pressure gradients.

97. (Withdrawn) The device of claim 96, wherein the fiber material web that is formed from the fibrous suspension is carried by at least one wire over at least one of at least one dewatering element, at least one forming element and at least one wire guiding element.

98. (Withdrawn) The device of claim 96, wherein at least one of said at least one dewatering element, said at least one forming element and said at least one wire guiding element is at least one foil strip positioned diagonally to a direction of web travel.

99. (Withdrawn) The device of claim 89, further including at least one dewatering box for at least one of a dewatering, a forming and a wire guidance, at least one dewatering box having at least one diagonally slotted plate cover relative to a direction of web travel, said at least one diagonally slotted plate cover providing a foil effect.

100. (Withdrawn) The device of claim 99, wherein said at least one diagonally slotted

plate cover includes at least one diagonally progressing bar, said at least one diagonally progressing bar has a discharge side, said at least one diagonally progressing bar is beveled on said discharge side.

5

101. (Withdrawn) The device of claim 99, wherein said dewatering box is supplied with a vacuum.

102. (Withdrawn) The device of claim 101, further including at least one of a controlled dewatering box supplied with a vacuum and a regulated dewatering supplied with a vacuum.

103. (Withdrawn) The device of claim 101, further including at least one graduated foil in combination with said at least one dewatering box.

104. (Withdrawn) The device of claim 99, further including at least one Varioline-strip in combination with said at least one dewatering box.

105. (Withdrawn) The device of claim 104, wherein said Varioline-strip is of an IBS Varioline-system.

106. (Withdrawn) The device of claim 96, wherein at least one of said at least one

dewatering element, said at least one forming element and said at least one wire guiding element include a curved surface over which the fibrous suspension is carried by at least one wire.

107. (Withdrawn) The device of claim 106, wherein said curved surface includes a curvature radius greater than 2 m.

108. (Withdrawn) The device of claim 106, wherein said curved surface includes a curvature radius greater than 5 m.

109. (Withdrawn) The device of claim 106, wherein said curved surface includes a curvature radius greater than 10 m.

110. (Withdrawn) The device of claim 106, wherein an angle of wrap is between approximately 10° to approximately 30°.

111. (Withdrawn) The device of claim 96, wherein at least one of said at least one dewatering element, said at least one forming element and said at least one wire guiding element include a plurality of sections viewed in cross direction, at least one of said at least one dewatering element, said at least one forming element and said at least one wire guiding element are adjustable in said plurality of sections.

112. (Withdrawn) The device of claim 111, further including a plurality of adjustment

parameters associated with said adjustable plurality of sections, said plurality of adjustment parameters are sectionally adjusted to influence a respective property profile of the fiber material web.

5

113. (Withdrawn) The device of claim 112, wherein said plurality of adjustment parameters are sectionally adjusted on a basis of at least one off-line measurement.

114. (Withdrawn) The device of claim 113, wherein said at least one off-line measurement, is a steady state off-line measurement.

115. (Withdrawn) The device of claim 113, wherein said plurality of adjustment parameters are sectionally adjustable by at least one of a manual adjustment and through a control system.

116. (Withdrawn) The device of claim 113, wherein said plurality of adjustment parameters are sectionally adjustable through at least one closed control loop.

117. (Withdrawn) The device of claim 116, wherein said at least one closed control loop is utilized that encompasses at least one of an in-line acquisition of a product characteristic to be influenced, a characteristic correlating with said product characteristic, at least one control algorithm and at least one relating final control element.

118. (Withdrawn) The device of claim 117, wherein said at least one relating final control element is at least one of a dewatering element, a forming element and a wire guiding element.

119. (Withdrawn) The device of claim 117, wherein at least one said control algorithm is incorporated into at least one said closed control loop for a mapping.

120. (Withdrawn) The device of claim 96, further including at least one angle of attack of at least one of said at least one dewatering element, said at least one forming element and said at least one wire guiding element, said at least one angle of attack being adjustable relative to a direction of web travel.

121. (Withdrawn) The device of claim 89, further including a dewatering box equipped with at least one of a plurality of vacuum zones and a plurality of vacuum elements, both said plurality of vacuum zones and said plurality of vacuum elements are arranged successively in a direction transverse to web travel, said at least one of a plurality of vacuum zones and a plurality of vacuum elements influencing a longitudinal/cross relationship.

122. (Withdrawn) The device of claim 89, wherein the device is carried out using a dewatering box including one of a cover and a plate, both said cover and said plate are diagonally slotted relative to a direction of web travel.

123. (Withdrawn) The device of claim 89, further including a dewatering box equipped with a plurality of foil strips arranged diagonally to a direction of web travel.

124. (Withdrawn) The device of claim 121, further including a plurality of vacuums in said plurality of vacuum zones, each said plurality of vacuums are individually controllable.

125. (Withdrawn) The device of claim 99, wherein at least one of said at least one dewatering element, said at least one forming element, said at least one wire guiding element and said at least one dewatering box is equipped with at least one slot having a changeable slot width.

126. (Withdrawn) The device of claim 125, further including a vacuum supply that is sectioned in a cross direction.

127. (Withdrawn) The device of claim 125, wherein only said slot width is adjustable thereby excluding a cross directionally sectioned vacuum treatment.

128. (Withdrawn) The device of claim 121, wherein said plurality of vacuum zones partially overlap.

129. (Withdrawn) The device of claim 123, wherein said plurality of foil strips include at least one foil angle, at least one said foil angle is between approximately 0° to 5°.

130. (Withdrawn) The device of claim 123, wherein said plurality of foil strips include at least one foil angle, at least one said foil angle is between approximately 0° to 3°.

131. (Withdrawn) The device of claim 89, further including a dewatering box with one of a perforated cover and a perforated plate.

132. (Withdrawn) The device of claim 89, further including a forming board, a dewatering box with at least one of a slotted cover, a perforated cover, a slotted plate and a perforated plate, and several foil boxes.

133. (Withdrawn) The device of claim 89, wherein the fibrous suspension is treated with a vacuum of between approximately 0 kPa to 50 kPa.

134. (Withdrawn) The device of claim 89, wherein the fibrous suspension is treated with a vacuum of between approximately 0 kPa to 25 kPa.

135. (Withdrawn) The device of claim 89, further including at least one of a Foudrinier-Former, a Twin Wire Former, a Gap-Former, a Hybrid-Former, and a graphic Former.

136. (Withdrawn) The device of claim 89, further including a machine equipped with a plurality of sheet formers for a plurality of multi-ply products.

137. (Withdrawn) The device of claim 136, further including one of a control system and a regulator system, each of said control system and said regulator system are effective only upon a ply.

138. (Withdrawn) The device of claim 136, further including one of a control system and a regulator system, each of said control system and said regulator system are effective upon a plurality of plies.

139. (Withdrawn) The device of claim 138, wherein each of said control system and said regulator system are effective upon all plies.

140. (Withdrawn) The device of claim 89, further including a medium stock consistency of the fiber suspension of between approximately 0.1% to 7%

141. (Withdrawn) The device of claim 89, further including a medium stock consistency of the fiber suspension of between approximately 0.5% to 5%.

142. (Withdrawn) The device of claim 89, further including at least one stock containing at least one of at least one recovered paper, at least one liner paper, at least one carton paper and at least one graphic paper.

143. (Withdrawn) The device of claim 142, wherein said at least one stock has a

medium stock consistency of between approximately 0.3% to 7%.

144. (Withdrawn) The device of claim 89, further including at least one stock containing sack Kraft paper.

145. (Withdrawn) The device of claim 144, wherein said at least one stock has a medium stock consistency of between approximately 0.1% to 4%.

146. (Withdrawn) The device of claim 89, further including influencing at least one of a forming property of the fiber material web and a tear length ratio R_T/R_Q property of the fiber material web.